

**We Claim:**

1. A method of matching a query fingerprint to a plurality of file fingerprints, the method comprising the steps of:
  - 5       Determining a plurality of partial features of each of the file fingerprints,  
          For each partial feature, deriving a list of all file fingerprints which have said partial feature as one of their partial features,  
          Determining a plurality of query partial features of the query fingerprint,  
          Deriving a ranked list of the file fingerprints based on identifying the individual  
10       query partial features in the partial features of the respective file fingerprints, and  
          performing a one-to-one matching of the query fingerprint with selected ones of the ranked list of the file fingerprints.
2. A method as claimed in claim 1, wherein the method comprises associating a  
15       discriminate score with each partial feature based on the number of file fingerprints which have said partial feature as one of their partial features, and the step of deriving the ranked list of the file fingerprints comprises updating scores for matches between the query fingerprint and individual ones of the file fingerprints based on the discriminate scores of one or more partial features identified in the individual file fingerprints as one of the  
20       query partial features.
3. A method as claimed in claim 1, wherein the partial features comprise minutiae feature sets.
- 25       4. A method as claimed in claim 3, wherein the minutiae feature sets each comprise a set of minutiae features for which a geometric separation between any two minutiae in it falls within a predetermined range.
5. A method as claimed in claims 3 or 4, wherein a number of minutiae features in  
30       each minutiae feature set falls within a predetermined range.
6. A method as claimed in claim 2, wherein the discriminate score is calculated in a manner such that it has higher values for partial features that occur in a smaller number of file fingerprints.

7. A method as claimed in claims 2 or 6, wherein the discriminate scores are further based on a total number of partial features in all of the file fingerprints.

5 8. A system for matching a query fingerprint to a plurality of file fingerprints, the system comprising:

a database having stored therein data providing a plurality of partial features of each of the file fingerprints and for each partial feature a list of all file fingerprints which have said partial feature as one of their partial features,

10 a processing unit for determining a plurality of query partial features of the query fingerprint and for deriving ranked list of the file fingerprints based on identifying the individual query partial features in the partial features of the respective file fingerprints from the data stored in the database, and

15 a one-to-one fingerprint matching unit for performing one-to-one matching between the query fingerprint and selected ones of the ranked list of the file fingerprints derived by the processing unit.

9. A system as claimed in claim 8, wherein the processing unit associates a discriminate score with each partial feature based on the number of file fingerprints which  
20 have said partial feature as one of their partial features, and updates scores for matches between the query fingerprint and individual ones of the file fingerprints based on the discriminate scores of one or more partial features identified in the individual file fingerprints as one of the query partial features during the deriving of the ranked list of the file fingerprints.

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10. A system as claimed in claim 8, wherein the partial features comprise minutiae feature sets.

11. A system as claimed in claim 10, wherein the minutiae feature sets each comprise a  
30 set of minutiae features for which a geometric separation between any two minutiae in it falls within a predetermined range.

12. A system as claimed in claims 10 or 11, wherein a number of minutiae features in each minutiae feature set falls within a predetermined range.

13. A system as claimed in claim 9, wherein the processing unit calculates the discriminate scores in a manner such that it has higher values for partial features that occur in a smaller number of file fingerprints.

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14. A system as claimed in claims 9 or 13, wherein the processing unit further bases the discriminate score on a total number of partial features in all of the file fingerprints.

15. A computer program, recorded on a medium, for instructing a computer to conduct a method of matching a query fingerprint to a plurality of file fingerprints, the method comprising the steps of:

10       Determining a plurality of partial features of each of the file fingerprints,  
          For each partial feature, deriving a list of all file fingerprints which have said partial feature as one of their partial features,  
15       Determining a plurality of query partial features of the query fingerprint,  
          Deriving a ranked list of the file fingerprints based on identifying the individual query partial features in the partial features of the respective file fingerprints, and  
          performing a one-to-one matching of the query fingerprint with selected ones of the ranked list of the file fingerprints.

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16. A computer program as claimed in claim 15, wherein the method comprises associating a discriminate score with each partial feature based on the number of file fingerprints which have said partial feature as one of their partial features, and the step of deriving the ranked list of the file fingerprints comprises updating scores for matches  
25       between the query fingerprint and individual ones of the file fingerprints based on the discriminate scores of one or more partial features identified in the individual file fingerprints as one of the query partial features.

17. A computer program as claimed in claim 15, wherein the partial features comprise  
30       minutiae feature sets.

18. A computer program as claimed in claim 17, wherein the minutiae feature sets each comprise a set of minutiae features for which a geometric separation between any two minutiae in it falls within a predetermined range.

19. A computer program as claimed in claims 17 or 18, wherein a number of minutiae features in each minutiae feature set falls within a predetermined range.
- 5 20. A computer program as claimed in claim 16, wherein the discriminate score is calculated in a manner such that it has higher values for partial features that occur in a smaller number of file fingerprints.
21. A computer program as claimed in claims 16 or 20, wherein the discriminate scores  
10 are further based on a total number of partial features in all of the file fingerprints.
22. A method of maintaining a database of file fingerprints, the method comprising the steps of:
- 15 Determining a plurality of partial features of each of the file fingerprints, and  
For each partial feature, deriving a list of all file fingerprints which have said partial feature as one of their partial features.
23. A method as claimed in claim 22, wherein the method comprises associating a discriminate score with each partial feature based on the number of file fingerprints which  
20 have said partial feature as one of their partial features.